AAT observations of Shoemaker Levy-9 collisions with Jupiter

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We will use the Infrared Imaging Spectrometer (IRIS) on the 3.9m Anglo-Australian Telescope (AAT) to observe the collisions of the fragmented comet Shoemaker Levy-9 (SL9) with Jupiter on July 16-22. This southern hemisphere site (31.28 S) is advantageous because Jupiter will be at -12° declination, and at least 6 impacts can be observed from this longitude (149.07%). The impacts of fragments D, K, N, and W will occur after suns% while the impacts of C and G will be visible before sunset- IRIS is versatile, near-infrared (0.9 to 2.5 μm) camera/ spectrometer with a 128 by 128 HgCdTe (NICMOS 2) detector. For imaging at f/15, the IRIS pixel scales are 0.61 and 1.94 arcsec. K-band images of comet fragments will be used for astrometry, and to search for evidence of further tidal disruption before impact. Long-exposure images will be used to monitor interactions between the SL9 dust veil and the Jovian magnetosphere and ring. Impact events will be monitored by rapid-sampling K-grism spectroscopy (2 to 2.4pm). In this mode, IRIS provides a spatial resolution of 0.6 arcsec/pixel along a 60 arcsec slit, a spectral resolution of -300, and readout times as short as 0.5 seconds. For all fragments except K, the slit will be placed across the limb at the impact latitude to provide time-resolved spectra of the fireball as it rises above the limb. For fragment K, the slit will be placed *acres the* disk of Europa, which will be in eclipse. Once the impact sites rotate into view, drift-scanning will be used to produce spectral images of the Jovian disk. Images extracted within strong CH_4 and H_2 bands will constrain the abundance, vertical distribution, and horizontal motions of aerosols produced by the impacts. These image cubes will also be used to search for trace gases of cometary and tropospheric origin (H_2O, CO, H_2S, etc.) deposited in the stratosphere by the impacts. Finally, the K-band cubes will monitor variations in the weak H_2 and H3+ auroral emission associated with the impacts.